BURLINGTON RESOURCES OIL & GAS COMPANY

IBLA 97-52 Decided July 20, 2000

Appeal from a decision of the New Mexico State Office, Bureau of Land Management, upholding compensatory royalty assessment for drainage from Federal Lease NMSF078604.

Reversed.

1. Oil and Gas Leases: Compensatory Royalty--Oil and Gas Leases: Drainage

   For purposes of assessing compensatory royalty, "common ownership" occurs when a lessee owns both the lease being drained and owns or participates in production from the offending well. A lessee which shares an ownership interest in an offended Federal lease with an owner or operator of an offending well does not become a "common lessee" solely by virtue of that shared interest.

2. Oil and Gas Leases: Compensatory Royalty--Oil and Gas Leases: Drainage

   Where no common lessee is involved in a drainage case, BLM must prove that a lessee actually knew or a reasonably prudent operator would have known that drainage was occurring or expected to occur. BLM must show the lessee had notice, whether "actual" or "constructive," that is sufficient to convey information about when drainage is occurring or expected to occur from the allegedly drained area. Proof of notice that compels further evaluation of data is, by itself, not sufficient to demonstrate what the prudent operator should have known or when it should have known it.

3. Oil and Gas Leases: Compensatory Royalty--Oil and Gas Leases: Drainage

   A lessee's obligation to drill a protective well to protect against drainage is triggered at the

time it should have known that drainage was occurring or was imminent, and compensatory royalties may be assessed beginning a reasonable time after that date of first knowledge. BLM cannot show that a lessee was compelled to drill a protective well if the record does not demonstrate that the lessee knew or should have known from data available at the time of the imputed knowledge that drainage from the allegedly drained area was occurring or was imminent.

APPEARANCES: W. Thomas Kellahin, Kellahin and Kellahin, for appellant; Bureau of Land Management, New Mexico State Office.

OPINION BY ADMINISTRATIVE JUDGE HEMMER

Burlington Resources Oil & Gas Company (Burlington) appeals from a Decision of the Deputy State Director of the New Mexico State Office, Bureau of Land Management (BLM), dated October 15, 1996, (NM) SDR 96-32 (Decision). The Decision assesses compensatory royalties against the company for drainage of coalbed methane from Federal Lease Number NMSF078604, for the period from June 1, 1985 through December 18, 1987. The Decision found that Burlington had constructive notice that drainage would occur from the portion of the lease comprising the north half (N1/2) of sec. 29 of T. 32 N., R. 10 W., New Mexico Principal Meridian, and "should have known the subject lease was being drained in late 1985." (Decision at 2.)

The Decision upholds an order of the Farmington District Office (FDO), BLM, dated August 26, 1996, determining that 633,600 Mcf of gas was drained from the N1/2 of sec. 29, located in the Fruitland coal formation, in almost equal proportion by three offending wells. The FDO order determined that the drainage factor was approximately 33 percent for each of the wells, and assessed compensatory royalty through December 18, 1987, the date of first production from Burlington's Scott No. 100 protective well.

Before discussing the specific contentions of the parties, it is helpful to set forth general legal principles that govern our disposition of drainage cases. Drainage occurs when a well is drilled close enough to the boundary of an adjacent parcel that oil or gas migrates from that parcel to the well.

Federal and Indian oil and gas lessees are obligated to protect the lessor against drainage. Federal regulations assure that protection will be afforded the Federal or Indian lessor either by the drilling of protective wells or by payment of "compensatory royalty."

Where lands in any leases are being drained of their oil or gas content by wells either on a Federal lease issued at a lower rate of royalty or on non-Federal lands, the lessee

> shall both drill and produce all wells necessary to protect the leased lands from drainage. In lieu of drilling necessary wells, the lessee may * * * pay compensatory royalty.

43 C.F.R. § 3100.2-2. The regulations also provide:

> The operating rights owner shall drill diligently and produce continuously from such wells as are necessary to protect the lessor from loss of royalty by reason of drainage. The authorized officer may assess compensatory royalty * * * adequate to compensate the lessor for operating rights owners' failure to drill and produce wells required to protect the lessor from loss through drainage by wells on adjacent lands.

43 C.F.R. § 3162.2(a); see also 30 C.F.R. § 221.21(c).

This obligation, however, is tempered by the longstanding prudent operator rule. This rule imposes on lessees, and the lessor, the strictures of common sense. If a prudent operator would have drilled a well, compensatory royalties would be due. But a lessee cannot be assessed for compensatory royalties if a prudent operator would not have drilled a protective well because the costs of drilling and operation would have exceeded the value of the oil and gas recovered. See Cowden Oil & Gas Properties, 126 IBLA 32, 43 (1993); Nola Grace Ptasynski, 63 IBLA 240, 252, 89 I. D. 208, 215 (1982). The determination of whether a protective well is economically feasible is based on the anticipated recovery and costs at the time that a prudent operator would have drilled the well, i.e., a reasonable time after the operator knew or should have known that drainage was occurring. See Atlantic Richfield Co., 105 IBLA 218, 225-26, 95 I.D. 235, 240 (1988).

Thus, a finding of economic feasibility, as well as the application of the prudent operator rule, hinges on notice of drainage. This Board has held:

> The obligation to protect a leasehold from drainage arises not upon completion of the draining well, but only after the passage of a reasonable time subsequent to notification by the lessor that an adjoining well is draining the leasehold. Thus, had appellant herein proceeded to complete an offset well within a reasonable time after notice, there would have been no assessment for intervening drainage.

Nola Grace Ptasynski, 63 IBLA 240, 256-57 (1982) (citation and footnote omitted). But notice need not always be provided by the lessor.

> Our review of Ptasynski prompts us to clarify that case in one regard. If BLM has not notified a lessee of drainage, but can prove that such lessee knew or that a reasonably prudent operator would have known that drainage was occurring,

> BLM may recover compensatory royalties. In such instance, the compensatory royalties would begin to accrue after the passage of a reasonable time following the date of the lessee's knowledge. This clarification is consistent with a prudent operator's duty to exercise reasonable care and diligence in protecting the lessor against drainage. * * * [I]f BLM is to assess compensatory royalties for any period prior to the time it gives formal notice, the burden of proving that a lessee knew or that a reasonably prudent operator would have known of drainage rests with BLM. See Lafitte Co. v. United Fuel Gas Co., 177 F. Supp. 52, 59 (E.D. Ky. 1959). Our clarification of Ptasynski in this respect allows BLM to assess compensatory royalties if BLM is able to prove that a lessee actually knew or a reasonably prudent operator would have known that drainage was occurring.

CSX Oil and Gas Corp., 104 IBLA 188, 198-99, 95 I.D. 148, 154 (1988) (emphasis added; citation and footnote omitted).

These rules are modified, however, in the case of a "common lessee," where the lessee on the offended lease or spacing unit is also owner or operator of the offending wells. Although the lessor and lessee generally share a common incentive to protect the lease from drainage, the lessee's incentive may be substantially diminished when he is also the lessee or operator of the offending (draining) well. Because the lessee shares in production from the offending well, even a profitable offset well may give that lessee little if any net gain, especially if the production from an offset well would diminish the recovery from the offending well. For this reason, the Board applies the prudent operator rule differently in a "common lessee" situation.

> [W]e have recognized two differences in the application of the prudent operator rule in the common lessee context. Although a lessee is ordinarily liable for drainage only after passage of a reasonable time from the date he knew or should have known that drainage was occurring, a common lessee whose operations are causing the drainage is in the best position to know that drainage is occurring and is presumed to have knowledge of the drainage upon first production from its offending well. Cowden Oil & Gas Properties, [126 IBLA 32, 42 (1993)]; Atlantic Richfield Co., 105 IBLA [218,] 226, 95 Interior Dec. [235,] 240 (1988). This presumption is rebuttable by the lessee whose operations are causing the drainage, but the lessee bears the ultimate burden of persuasion as to notice of drainage.
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> The second distinction in the application of the prudent operator rule in the common lessee situation involves the allocation of the burden of proof. Although BLM has the burden of establishing that the leased Federal tract is being drained by the common lessee's non-Federal well, BLM does not carry the

> burden of establishing that a protective well would be economic. In common lessee cases, the burden of producing evidence and the ultimate burden of persuasion on this issue rests with the lessee whose operations are causing drainage. Id. at 225, 95 Interior Dec. at 239; see NGC Energy Co., 114 IBLA 141, 153, 97 Interior Dec. 159, 165 (1990); Cordillera Corp., 111 IBLA 61, 66 (1989).

Forest Oil Corp., 141 IBLA 295, 298 (1997) (footnote omitted). See also Petroleum, Inc., Pennzoil Co., 115 IBLA 188, 192 (1990) (common operator, like common lessee, presumed to know of drainage on first production from offending well; that presumption is rebuttable; common lessee "bears the ultimate burden of persuasion with respect to notice").

Turning to the instant case, BLM alleges drainage of coalbed methane gas from some unspecified date after June 1, 1985, until Burlington began producing from an offset well on December 18, 1987. 1/ The parties agree that during this critical period, "coalbed methane development was new, unproven, technology." (BLM Response to Statement of Reasons (Response) at 8.) In order to affirm the compensatory royalty assessment for this entire period, we must be able to determine from this record that Burlington knew, or should have known, a reasonable time prior to June 1, 1985, that drainage was occurring from the offended spacing unit, and that an offset well would have been economic to drill there at that time. To affirm an assessment of compensatory royalty for any time prior to December 18, 1987, we must find that the company should have had this knowledge prior to the reasonable time we must afford it to have undertaken to drill the producing offset well.

The relevant leases and coalbed methane wells are located in the San Juan Basin, which extends through northern New Mexico into Colorado. The wells produce from the Fruitland coal formation. The four relevant wells are located within a four section square, comprising secs. 28, 29, 32, and 33 of T. 32 N., R. 10 W. They are located in the "Cedar Hill Fruitland Coal Pool," which "is comprised of approximately 16 square miles located in Townships 31 and 32 North, Range 10 West in San Juan County, New Mexico, * * * extending across the State line into Colorado." (Response Exhibit 2, "Chronology of Events.") According to BLM, the pool was identified at an "NMOCD hearing" in January 1984. 2/

1/ Lease NMSF078604 was issued to El Paso Natural Gas Company, which subsequently reorganized under the names El Paso Production Company, Meridian Oil Company, and Burlington Resources Oil and Gas Company. For ease, we identify the appellant as Burlington in all instances.

2/ The NMOCD is the State of New Mexico, Energy and Minerals Department, Oil and Conservation Division. (BLM Farmington District Office Final Engineering Report (FDO Report), Exhibit U, Transcript Cover Page.)

The allegedly offended spacing unit is covered by Federal Lease NMSF078604. For periods relevant to this case, Amoco Production Company (Amoco), Burlington, and Total-Minatome shared an interest in this lease, which comprises the N1/2 of sec. 29 and approximately 50 percent of the S1/2 of the section.

The three alleged offending wells were drilled on private or State land and were operated at all times by Amoco. 3/ Amoco was the first coalbed methane gas producer in the San Juan Basin, and began producing in 1978 from the Cahn Gas Com Well No. 1 (Cahn well). This well is allegedly an offending well; it is located in the NW1/4 of sec. 33. According to BLM it is located 3,900 feet southeast of the offended spacing unit (the N1/2 of sec. 29). (FDO Report at 2.) BLM and Burlington agree that the Cahn well is in the NE1/4NW1/4 of sec. 33. Id. at 1; SOR at 2; Map Attachment to Burlington October 22, 1992, letter to BLM; see Well Completion Report, contained in FDO Report. 4/

Amoco began producing from the second alleged offending well, the State Gas Com BW Well No. 1 (State well), in 1981. Burlington alleges that the location is the NE1/4NE1/4 of sec. 32. (SOR at 2.) Maps at BLM Exhibits 1 and 3 indicate otherwise; by both maps, the well is in the NW1/4NE1/4 of sec. 32, consistent with a Burlington Map attached to a Burlington October 22, 1992, letter to BLM. See Well Completion Report in FDO Report. According to BLM, the well is 3,200 feet south of the offended spacing unit, in sec. 32. (FDO Report at 2.)

Amoco began production from the third offending well, the Schneider Gas Com B Well Number 1S (Schneider well), in 1981. Both parties agree that this well is located in the SW1/4SW1/4 of sec. 28. (SOR at 3, BLM Exhibits 1 and 3; Map Attachment to Burlington October 22, 1992, letter to BLM.) BLM alleges that it is 1,750 feet southeast of the offended spacing unit. (FDO Report at 2.) 5/

By 1984, Amoco remained the only producer of "Fruitland coal wells producing in the Cedar Hills area." (FDO Report at 7.) On January 18, 1984, Amoco and Burlington participated in an NMOCD hearing in Santa Fe. According to BLM, pool spacing was set at 320 acres in "NMOCD Order

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3/ Burlington asserts that the Federal Government received royalties on production from these wells. (Burlington Statement of Reasons (SOR) at 3.) The record does not support this assertion.

4/ BLM's map at Response Exhibit 3 is consistent with the parties' stated description, but a map at BLM Response Exhibit 1 places the Cahn well closer to the offended spacing unit than just described, in the NW1/4NW1/4 of sec. 33.

5/ Amoco also began producing from the State Gas Com BX #1 well and Sammons Gas Com well in 1983 and 1985, respectively. (Response Exhibit 2 at 1-2.)

R-7588." Id. at 8. BLM does not submit NMOCD Order # R-7588 but states that "any well staked in the Cedar Hills Pool would be 790'-1190' from the lease line of the adjacent spacing unit on the long side of the rectangular spacing unit." Id. We surmise that this Order is the source of the establishment of spacing units in (a) the S1/2 of sec. 29, comprised of a portion of this lease and non-Federal lands, 6/ and (b) the N1/2 of sec. 29 comprised entirely of a portion of Federal Lease NMSF078604.

In 1986, Burlington began investing in a pilot project to develop Fruitland Coal gas wells on its leases. (Response Exhibit 2, "Chronology of Events," at 2.) Burlington invested $9 million in a program to drill 20 such wells. According to Burlington, it drilled four wells in a "four well pilot program in 1985-86 to evaluate a new resource." (SOR at Exhibit 3, Affidavit of Leonard J. Biemer, Jr. (Biemer Aff.) at 8, paragraph 5(a)(i).) Burlington expanded the program by drilling 16 wells in 1987, and 180 wells in 1988. Id. at subparagraphs (ii) and (iii).

On December 18, 1987, Burlington began producing from the protective Scott 100 Well (Scott 100) in the N1/2 of sec. 29. It is not clear whether this well was one of the 16 wells drilled under Burlington's pilot program in 1987, or an additional well. According to Burlington, the "economics of this protection well did not compete with the pilot projects." (Attachment to Burlington's October 22, 1992, Letter to BLM re: Case #SF-078604-6.) On January 2, 1992, Burlington began producing from the Scott Com # 291 (Scott 291) protective well in the communitized S1/2 of sec. 29.

On September 8, 1992, BLM sent Burlington a notice of potential drainage from the spacing unit comprising the N1/2 of sec. 29. (SOR Exhibit 5.) According to this notice, identified as drainage case SF-078604-6, BLM believed that the portion of Federal Lease NMSF078604 committed to the northern spacing unit had been drained by the Schneider well prior to 1987. 7/ The letter ordered Burlington to "submit detailed engineering, geologic, and economic data showing that either: (1) no drainage did occur or (2) that it was not economically feasible to drill a protective well during this intervening time period." Id. According to the notice, it was sent to "all lessees of SF-078604." Id.

On October 22, 1992, Burlington sent the demanded response regarding drainage of the N1/2 of sec. 29. 8/ Burlington contended that the

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6/ The S1/2 of sec. 29 contains a total of 164.44 acres of Federal Lease NMSF078604. This Federal acreage was apparently communitized with fee interests by Communitization Agreement No. 89370. See SOR Exhibit 6, Aug. 23, 1995, BLM letter to Burlington re drainage from S1/2 of sec. 29; see also BLM Response Exhibit 10, CA 89370 Map.
7/ The letter states that the Scott 100 well went on production on Dec. 18, 1988, and that drainage occurred before that time. Given the undisputed fact that the Scott 100 began producing in 1987, the 1988 date was clearly a typographical error.
8/ The record shows great confusion between this letter and a Burlington response to a drainage letter regarding the S1/2 of sec. 29. BLM refers

Schneider well did not drain the spacing unit. Burlington argued that the initial reservoir pressure of the Schneider well was 1,200 psi in 1981, while the initial reservoir pressure of the Scott 100 protective well, drilled in 1987, was 1,197 psi. (Attachment to Burlington's October 22, 1992, letter.) According to Burlington, this showed that no drainage had occurred between the two. Id. Burlington submitted "Production Well Economics" data in which it concluded that drilling an offset well to protect against drainage from the Schneider well was uneconomic prior to 1987. On February 9, 1993, Burlington sent another letter to BLM denying drainage from the Schneider well, and denying that it had any knowledge of that well's productive capabilities because it had no equitable interest in that well. 9/

No further correspondence between BLM and Burlington appears in the record until 1995. On August 23, 1995, BLM issued a drainage assessment to Burlington for drainage from the S1/2 of sec. 29, asserting that the three Cahn, Schneider, and State wells had drained the Federal portion of the S1/2 spacing unit of 599,742 Mcf of gas for the period beginning June 1, 1985, until January 2, 1992. (SOR Exhibit 6; BLM Response Exhibit 9.) The parties settled this case.

On August 26, 1996, a year after the drainage assessment involving the S1/2 of sec. 29 and 4 years after the first notice involving drainage from the Schneider well of the N1/2 of sec. 29, BLM sent Burlington a drainage assessment letter. This letter asserted, for the first time as far as the record shows, that 633,600 Mcf of gas had been drained from the spacing unit in the N1/2 of sec. 29 as a result of production from all three wells — the Cahn, Schneider, and State wells. (SOR Exhibit 2.) According to the record, the August 26, 1996, drainage assessment is based on the August 16, 1996, FDO Report. A cover memorandum to the Report explains that BLM and Amoco had settled all their drainage disputes within sec. 29 and that, because Total-Minatome acquired its interest after the protective well went into production, it was not assessed for drainage.

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fn. 8 (continued)
to a Burlington "Sept. 22, 1992" memorandum (FDO Report at 7), and attaches it to its Response at Exhibit 8 in this case. But this letter is a Sept. 18 document received by BLM on Sept. 21, which states that "pursuant to [BLM's] request and conversation" Burlington submitted an "amended discussion * * * originally submitted September 15, 1992," regarding case "#SF078604-3" involving drainage from the S1/2 of Section 29. In an attachment entitled "Production Well Economics," Burlington took the position that the Scott 291 well in the S1/2 of sec. 29 was drilled only at the point it was economic to do so. BLM confuses this document with one pertaining to the Scott 100 well in the N/2 of sec. 29. The attachment also purports to be accompanied by Figures 1 and 2. No figures appear at BLM Exhibit 8. BLM may be confusing the Sept. 18 letter with the Oct. 22 letter, and its attachments.

9/ This letter also confuses production from the Scott 100 well with the Scott 291 well.

According to the FDO Report, the calculation of drainage was based on the following summary:

> Initial bottom hole pressure in the area (1562 PSI) was taken from the Cahn Gas Com #1 NE/NW Section 33, T-32N, R-10W. Bottom hole pressure at the Scott #100 (protective well) was calculated from shut-in surface pressures reported on the completion report. The calculated bottom hole pressure of 1205 PSI compares favorably with the 1197 PSI reported as measured reservoir pressure in [Burlington's] correspondence dated October 22, 1992. The initial reservoir pressure from Cahn #1 and the calculated pressure from Scott #100 were used to calculate reservoir depletion in the offended spacing unit between May 1977 and December 1987. Initial gas in place @ 1562 PSI was 505 scf/Ton. This volume was reduced to 480 scf/Ton at the time the Scott # 100 was completed. Initial reservoir gas (in the offended spacing unit) was depleted by 25 scf/ton prior to first production from the protective well. Total coal thickness in the offended spacing unit is 44'.

(SOR Exhibit 7, Drainage Worksheet, Fruitland Coal SF-078604(9), Cedar Hills Pool.) 10/

On September 23, 1996, Burlington challenged the drainage assessment, largely on the same grounds stated in its October 22, 1992, letter. Burlington stated that its

> analysis indicate[s] that (1) no drainage occurred [to] said lands from the offsetting Fruitland Coal Wells, (2) if drainage did occur, Burlington's well in the N/2 Sec. 29, was producing prior to our receiving actual knowledge of the offsetting pro-duction, and (3) drilling a "protection well" would have been uneconomical.

On October 15, 1996, the Deputy State Director issued a decision upholding BLM's August 26, 1996, drainage assessment letter on grounds that Burlington failed to fully address drainage from the Cahn and State wells. The decision assessed royalty "for the period June 1, 1985, through December 18, 1987." (Decision at 1.) It cites the FDO Report and states that Burlington "should have known that the subject lease was being drained in late 1985. Burlington was investing in a 20-well drilling program in

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10/ Typed on the Exhibit is the statement: "Exhibit J from 'FDO Final Engineering Report' dated Oct. 16, 1995." The document is the same as one attached to the Aug. 16, 1996, FDO Report with no Exhibit letter. See also FDO Report at 3.

the area and had considered the offended lease as a drilling target during that time period. This meets the definition of 'constructive notice' as determined * * * in CSX Oil and Gas Corp., 104 IBLA 188 (1988)." (Decision at 2.)

Burlington filed a timely Notice of Appeal on November 12, 1996, and its SOR on December 11, 1996, challenging BLM's Decision and underlying findings. First, Burlington argues that, rather than assess compensatory royalty from the time of constructive notice, BLM included all drainage occurring from 1978. (SOR at 6.) Second, Burlington challenges the FDO Report and asserts that it derived erroneous volumetric calculations by using "incorrect reservoir thickness, incorrect allocations and incorrect reservoir pressure." Id. at 7. Third, Burlington argues that, if drainage occurred at all, usage of the correct geological data would result in a calculation that "could not be more than 181,440 Mcf." Id. at 8. Fourth, Burlington argues that BLM's date of constructive knowledge, which Burlington construes to be June 1, 1985, is erroneous and based on speculation. Id. at 10.

Fifth, Burlington contends that the drainage calculation of 633,600 Mcf from the N1/2 of sec. 29 from 1985 to 1987 makes no sense in light of a lesser calculation of drainage (599,742 Mcf) from the closer S1/2 of sec. 29 for the period from 1985 to 1992, when the Scott 291 well began producing. Id. at 11. Burlington points out that the alleged offending wells were in locations bordering, and closer to, the S1/2 of sec. 29; the N1/2 of the section is further to the north and west. According to Burlington, BLM's decision was arbitrary in that respect. Id. Sixth, Burlington presents technical evidence by a petroleum engineer and a petroleum geologist concerning its geological contentions and seeks an evidentiary hearing on these topics. (SOR at 12; Burlington affidavits at Exhibits 3 and 4.)

In its Response, 11/ BLM contends that Burlington's argument that drainage was assessed since 1978 makes no sense since drainage was not occurring from the N1/2 of sec. 29 as late as June 1, 1985. (Response at 4.) BLM states that since drainage did not begin until 1985 or later, Burlington's argument is a red herring. Id. at 4.

11/ BLM's brief contains no signature page; the certificate of service has a typewritten block stating simply "Field Solicitor," with no verifying name or signature. The document is not prepared in the normal fashion of briefs filed by the Solicitor's Office. It contains highlighted comments in multi-color set-off blocks, a format identical to that of the FDO Report, suggesting that BLM drafted both. If this is the case, we admonish BLM to refrain from indicating that its documents are filed or signed by the Solicitor's Office, and advise BLM to obtain signatures for documents that accurately reflect responsibility for their production.

BLM's contention about notice is, alternatively, that (a) this case presents a common lessee situation; (b) Burlington received actual notice of potential drainage from Amoco's testimony at the NMOCD meeting on January 14, 1984; and (c) Burlington would have had to have knowledge of potential drainage in order to initiate its pilot project in 1985-86. Id. at 3, 7, 8. In response to Burlington's data, BLM sets forth and relies on considerable geologic data regarding wellbore penetration, definition of Upper and Basal coal seams, and casing perforation. Id. at 5. With respect to Burlington's argument that BLM was arbitrary for assessing less compensatory royalty with respect to the S1/2 of sec. 29, BLM points out that only half of that spacing unit was located on Federal lands, and also that, according to BLM, drainage of the S1/2 began earlier than June 1, 1985. Therefore, according to BLM, it did not and could not have assessed royalty for drainage prior to the time Burlington had constructive knowledge. Id. at 8, citing BLM Exhibits 3, 7, and 10. Finally, BLM asks that the request for evidentiary hearing be denied, on grounds that the Board may rule on the basis of this record. Id. at 9.

Analysis

Despite BLM's confidence that this Board may readily sort out the facts, this record presents too little undisputed information for the decisive rulings BLM seeks regarding the facts. Nonetheless, this appeal raises notice issues, a ruling on which may moot further investigation into facts about drainage and call for reversal. Thus, we turn to questions of how and when Burlington allegedly received notice of drainage and when it should have expected this drainage to occur from the N1/2 of sec. 29.

A. Notice.

It is undisputed that BLM first provided actual drainage notice in 1992, years after the protective well went into production. That notice related only to the Schneider well. BLM did not notify Burlington of its view that the Cahn and the State wells were sources of drainage until the drainage assessment letter of August 26, 1996 — more than 10 years after the start of the alleged drainage period.

BLM's position is that its own notices are irrelevant because Burlington allegedly knew or should have known something about drainage long before those dates. BLM presents a number of positions, some of which are not altogether consistent, on what constituted this alleged notice, when it should have been sufficient to require a protective well, and even what type of notice it was. The October 15, 1996, Decision relies on a theory of "constructive notice," dependent on Burlington's investment in a 20-well drilling program in the Fruitland coal formation. (Decision at 2, citing CSX Oil and Gas Corp., 104 IBLA at 188.) BLM's brief before the Board states instead that it relies on "actual notice" from the NMOCD hearing in January 1984. (Response at 7.)

Further, BLM argues in its Response that because Amoco and Burlington shared ownership of the offended spacing unit, this is a "common lessee

situation." BLM states that this issue "was addressed in detail in FDO's Engineering Report beginning at the bottom of page 6 under the heading 'Common Ownership and Constructive Notice'." Id. at 7. The Report states:

> [Amoco] has owned 28.125% of Federal Lease SF-078604 (offended lease) since the lease was issued in 1948. Amoco also operates all three offending wells. This establishes common ownership between the offending wells and the offended spacing unit. The Office of the Solicitor, in Memorandum #BLM.ER.0648, gave the following opinion regarding common ownership. "In common les-see drainage, the lessee shall be presumed to have knowledge of drainage upon first production of its offending well."
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> It was interesting to note in correspondence from Amoco to the BLM dated January, 1994, that Amoco designated Meridian to respond to the BLM on their behalf. See Drainage Case SF-078604(11).

(FDO Report at 7.) 12/ It is not clear whether the Deputy State Director meant to endorse this notion when he endorsed the FDO Report. (Decision at 2.)

BLM's position is complicated further by the fact that it does not present a clear picture of how its arguments apply to the facts of record. As the FDO Report notes, a common lessee would be presumed "to have knowledge of the drainage upon first production from [the] offending well." Forest Oil Corp., 141 IBLA at 298. But BLM does not take the position that Burlington should have known of drainage from the 1978 and 1981 dates of production from the three offending wells. Rather, BLM argues that Burlington received "actual notice" of the "potential for drainage" from Amoco's 1984 NMOCD testimony. (Response at 7.) In turn, this statement exaggerates the FDO Report, which does not impute to Burlington knowledge of "potential drainage" but, rather, it states Burlington should have known "to evaluate offset production to determine if a protective [well] was required." (FDO Report at 7.) It is not clear whether or not BLM believes this to be true based on its view of what it identifies as the "common lessee situation." Finally, BLM argues that Burlington should have drilled a protective well to protect against the eventuality that drainage would occur, but does not clearly state when Burlington should have come to believe drainage would have begun based on the testimony or its subsequent "evaluation of offset production."

Thus, apart from seeking affirmance of the outcome, BLM does not clarify the basis for that conclusion. The simple answer would be to reject BLM's arguments as confused and misrepresentative of Board precedent on the topics of notice and the effects on compensatory royalty assessments of common lessee situations. Nonetheless, we will attempt to sort out the rulings we would be required to make in order to affirm BLM, and why we cannot.

12/ BLM does not submit "Office of the Solicitor Memorandum #BLM.ER.0648," or data about "Drainage Case SF-078604(11)."

[1] First, we are unable to affirm that Burlington's sharing of a lease interest with Amoco makes the situation before us one of "common ownership." As demonstrated in the background to this opinion, "common ownership" occurs when a lessee owns both the lease being drained and the offending (draining) wells. The document we believe to be the one BLM relies on as "Office of the Solicitor Memorandum #BLM.ER.0648" merely confirms this understanding. A February 28, 1988, Memorandum from the Assistant Solicitor, Onshore Minerals, Energy and Resources, to the BLM Assistant Director for Energy and Mineral Resources, regarding "Various Drainage Issues," states at page 3: "[T]he applicability of the prudent operator rule becomes questionable when our lessee both holds the Fed-eral/Indian lease being drained, and owns the well which is draining the Federal/Indian lease." (Emphasis added.)

That situation is not present here, because Burlington does not own an interest in, or participate in the operation of, any offending well. Amoco was a common lessee to all of the offending wells and the offended spacing unit. But Amoco is not and has never been a party or implicated in any way. BLM separately settled with Amoco; thus, we have no reason to opine about Amoco's obligations with respect to the N1/2 of sec. 29.

Moreover, we find no Board precedent for extending the "common lessee" definition to any entity that might share an interest in a lease with the owner of an offending well, or to any situation in which the existence of "common ownership between the offending wells and the offended spacing unit" (FDO Report at 7) may be found. To the contrary, in Forest Oil Corp., this Board described the sina qua non of a common lessee situa-tion as control of and interest in the offending well by the lessee on the offended Federal lease. There, the appellants argued that Exxon Corporation's partial interest (46.6667 percent) in the offending well deprived Exxon of common lessee status.

> This difference is not sufficient to deprive the lessee of the drained tract of its position to know that drainage is occurring and thus does not warrant abandoning the presumption that the lessee had knowledge of the drainage upon first production from the offending well. Knowledge of drainage is properly imputed to a lessee of the drained tract who participates in the operation of the offending well. Cowden Oil & Gas Properties, [126 IBLA at 42].

141 IBLA at 298 n.4 (emphasis added). 13/ Similarly, in Benson-Montin-Greer Drilling Corp., 123 IBLA 341, 348-50, 99 I.D. 115, 119 (1992), the

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13/ In that case BLM expressly notified the lessees of the potential for drainage in 1988, before the 1990 to 1992 drainage period. Forest acquired its lease interest in 1991 from TOC Rocky Mountains, Inc. BLM assessed Forest liability only for drainage "6 months from acquisition of a lease interest and, hence, Forest's liability would commence on January 1, 1992." Id. at 296.

Board found that a party which obtains an interest in a lease being drained by that party's offending well cannot be assessed for drainage until such time as it becomes a common lessee.

Moreover, while we did not directly rule on the issue in Kerr-McGee Corp., 118 IBLA 119 (1991), aff'd, Civ. No. 91-CV-0097-B (D. Wyo. Dec. 19, 1991), we noted differences in BLM's identification of notice to Federal lessees who were common to the offending wells and those who were not.

> As to those Federal lessees which were not common to the offending well, the BLM decision held that the authorization for expenditure (AFE) forms dated Jan. 27 and June 14, 1982, proposing to drill, test, and complete a well offsetting the 16-36 well which were circulated to all prospective participants, including lessees and working interest owners, provided notice of the drainage situation * * *.

118 IBLA at 123 n.4 (emphasis added).

None of these cases addresses head on the contention BLM suggests we adopt — that Burlington's sharing of the offended lease with the owner of the offending wells makes Burlington a common lessee. But each case makes clear that to impute the knowledge of a common lessee to a lessee of an offended lease requires some "participat[ion] in the operation of the offending well." Forest Oil Corp., 141 IBLA at 298 n.4.

We will not diverge from this rule on the facts here. Nothing in this record suggests Burlington had any other than public knowledge of the operations of the offending wells. Burlington had no incentive to maintain high production from Amoco's offending wells. The record does not suggest any common ownership and control between Burlington and Amoco. In such a case, a finding that Burlington is a common lessee would discount competitive business practices. During the period critical to notice here, Amoco was the only producer of coalbed methane in the San Juan Basin and Burlington was undertaking a pilot project for up to 20 wells to determine how best economically to produce this newly developed resource. Nothing in this record suggests the companies were anything but competitors in the San Juan Basin. We have no basis for imputing to Burlington knowledge of a common lessee regarding Amoco's wells. 14/

[2] Thus, BLM may not extend the title of "common lessee" to Burlington's position. The practical effect of this conclusion is that BLM bears the burden of proof to show Burlington had notice that drainage would

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14/ The fact "that Amoco designated Meridian to respond to the BLM on [its] behalf," (FDO Report at 7, citing Drainage Case SF-078604(11)), does not change this conclusion. Whatever Amoco's logic, this fact only represents Amoco's reliance on a co-lessee of the lease; it is not evidence of Burlington's knowledge of Amoco's data.

occur such that it should have drilled a protective well in the N1/2 of sec. 29 by June 1, 1985. BLM must "prove that a lessee actually knew or a reasonably prudent operator would have known that drainage was occurring." CSX Oil and Gas Corp., 104 IBLA at 198-99.

Contrary to BLM's assertion about "actual notice," we cannot rule that testimony that drainage may occur "at some point" from a 640-acre sec. 29 encompassing the geographically further of two spacing units is sufficient to convey the information BLM must show to meet its burden regarding notice of drainage. Time elements exist within the concept of notice. The party with the burden of proof must show when the lessee did or should have knowledge, and also that the knowledge imparted information as to the timing of drainage — when it is occurring or would be expected to occur from the allegedly offended unit.

BLM does not fit its proof of "actual notice" into these parameters or separately identify what Burlington should have gleaned about the N1/2 of sec. 29. Instead, BLM states:

> Burlington's representatives attending the Spacing Hearing for Cedar Hill Pool on January 18, 1984 heard Gary Paulson's testimony that Section 29 "May be subject to drainage at some point". This testimony, presented by an Expert Witness From Amoco Production Company, (one of the Lessees) provided ***Actual Notice*** of the potential for drainage in Section 29.

(BLM Response at 7 [sic].) This commentary provides no explanation as to what Burlington should have known about the N1/2 of sec. 29. As noted above, the FDO Report was less definitive as to drainage even within the section. There, BLM stated that this "testimony," some pages of which BLM attaches at Exhibit U, would have prompted a prudent operator "to evaluate offset production to determine if a protective [well] was required."

We do not digress here to consider the distinction between a lessee's knowledge of drainage (which is what BLM is required to prove), as opposed to "actual notice" that would compel further evaluation (which is what BLM alleges), because our review of this testimony is that it reveals very little. Even if BLM were required only to prove "actual notice" that amounts to the beginning point of a set of events which would have compelled Burlington to investigate, and eventually reach the conclusion to drill a well within the N1/2 of sec. 29 by some date in 1985, we cannot construe the testimony to have generated this chain reaction.

Before turning to the testimony excerpts before us, we address BLM's suggestion that the testimony should have revealed something to Burlington because it shared a lease with Amoco, rather than because it was present at the hearing. See FDO Report at 7 ("all three lessees attending the hearing.") We find that the testimony on the record could be construed by Burlington in the same way as any entity present. The fact that it was a common owner of a lease subject to a spacing order hearing may have com-pelled its attendance but does not change the import of the testimony.

Also, as BLM concedes, the purpose of this hearing was to decide spacing units. BLM notes:

> [T]he purpose of the hearing was to determine the area each well was capable of draining in order to set proper spacing for orderly development of the resource. Drainage was addressed on numerous occasions during the hearing (documented by yellow highlights in ***Exhibit U***), which established that each well would be capable of draining more than 160 acres, but less than 640 acres.

(FDO Report at 7 (emphasis added).) Thus, the result of the hearing even as to spacing was ambiguous. At least one witness anticipated that the results of the hearing were expected to be "temporary," pending further data collection, and a subsequent NMOCD hearing was conducted regarding further information and decisionmaking in January 1988. (Response Exhibit 2, "Chronology" at 2.)

Finally, no portions of Exhibit U to the FDO Report appear "highlighted" in our record. BLM presents only random pages of testimony (26, 34, 37, 39, and 50-52).

This stated, BLM's contention is that Amoco's prediction of drainage of sec. 29 "at some point" should have alerted Burlington that drainage of the N1/2 of sec. 29 would require a protective well some time in 1985, or to study the matter such that this information would have become apparent. The transcript is not so suggestive to us. A witness stated:

> We, of course, have to get the time factor, I think, involved to answer the proper spacing.
>
> The reason I showed the five exhibits which were the production curves, was to make it clear that we — we can't use these to arrive at any future recovery of these wells. We haven't seen a drop off. There is not enough knowledge in this new field to project when it might happen. I believe we'll see some when we reach a critical dewatering stage.

(Transcript at 37.) 15/ Page 38 is missing, so either this or a different witness went on to state:

> So to prevent the drilling of unnecessary wells, at least at this time, we have proposed 320 spacing to allow development of this — this pool we've defined and allow accumulation of additional data.

15/ The record does not identify the witness, but we surmise it is an Amoco representative, testifying as to its then-existing five wells in the San Juan Basin. See note 5, supra.

The reason we asked for a temporary order for two years was due to some of the unknowns that I've discussed. We're in a new field.

(Transcript at 39.)

Later, an Amoco witness identified as "Mr. Boyce" (perhaps a mistaken reference to Mr. Paulson) testified about information to be gained in the next 2 years.

[I]f we plot that on the Cahn curve, it's — we've got one, two, perhaps three total years of production, and the production was up to over a million a day, and in a well a mile away we hadn't yet seen any indication.

So the logical conclusion is somewhere between 150 and 320. Definitely we're having an effect on a 160. We haven't seen any after three years on a 640, and my conclusion, then, is that 320 spacing to arrive at some normal type pattern, we can't [sic] pick any between those, that 320 is proper at this time.

* * * * * * *

Q What would you expect to learn in a two more year period in terms of pressure information?

A Well, as far as the first two wells, the Cahn and the Schneider, probably not too much more.

* * * * * * *

From the Leeper [sic], if we do see some slight reduction in the next couple of years, it could mean several things. One, that we have a high permeability streak here; one that maybe in some good areas you — you're not going to drain 640 but you may see some communication.

So in the next two years this will be a continuation that will add to the mass of knowledge. I can't really say right now what additional we would — we would gain from it.

Id. at 50-51. The witness was asked:

Q [W]ould you be of the opinion that the southeast quarter of Section 29 is a — has a strong potential for drainage from the three offsetting wells that currently exist?

A No more than any other part of our pool. * * * The pattern we've established with one exception is a northwest — or northeast/southwest, and I really don't think in this pool,

with the — with the evidence of communication we've seen that any one area is any more subject to drainage than the other. * * *

There are no wells in 29. I'd have to say with no wells, it may be subject to drainage at some point; certainly not now.

Q [C]ould you state a position on behalf of Amoco regarding the possible concurrence with or objection to [Burlington's] drilling of a well in the southeast quarter of Section 29, which under the proposed rules would be an unorthodox location?

A * * * I really can't. I'm an engineering witness * * * so I really can't comment on it.

Id. at 51-52 (emphasis added).

These random pages of testimony suggest a more complicated picture from the one inferred by BLM from the nine words — "it may be subject to drainage at some point" — upon which BLM rests its "actual notice" contention. The selected pages reveal that Amoco had petitioned for a spacing order of 320 acres, based on the fact it was seeing some pressure communication at 160 acres. The witnesses testified as to a great lack of understanding of the data, "not enough knowledge in this new field," a need for reevaluation within 2 years, and a refusal to state whether Burlington should even drill from the southeast part of sec. 29, the closest location to all three wells. Further, the Amoco witness testified that Amoco saw a strong "northeast/southwest" drainage trend. This trend is consistent with BLM's map at Response Exhibit 7, but is inconsistent with the notion that Burlington should have anticipated a turn to the northwest — an inference which would have been required for it to have expected imminent drainage of the N1/2 of sec. 29.

Restating the current law, this Board "allows BLM to assess compensatory royalties some reasonable time after BLM is able to prove that a lessee actually knew or a reasonably prudent operator would have known that drainage was occurring." CSX Oil and Gas Corp., 104 IBLA at 198-99; see also Forest Oil Corp., 141 IBLA at 298 ("BLM has the burden of establishing that the leased Federal tract is being drained"); Benson-Montin-Greer Drilling Corp., 123 IBLA at 347 (referring to "notice that drainage was occuring"). BLM asks us to go further and conclude that BLM may assess compensatory royalty from the N1/2 of sec. 29 (the spacing unit furthest from the offending wells) some reasonable time after a prudent operator receives notice that drainage from a broader geographical area "may occur at some point" in the future but is "certainly not [doing so] now."

We do not issue here a rule that notice of impending or imminent drainage can never compel protective drilling in the absence of actual drainage. But we find that BLM's proof of "actual notice" is insufficient to prove what should have or even could have been understood by Burlington

at that time about the N1/2 of sec. 29. BLM fails to prove any link between the testimony and the conclusion that Burlington should have begun to drill the Scott 100 before 1987. (BLM Response at 7.) The notion that drainage could be expected "at some point" simply does not connect with any knowledge Burlington should have had within the drainage period as to when drainage would be expected to begin from the N1/2 of sec. 29.

[3] Finally, having determined that the alleged "notice" was insufficient on its face to compel a protective well, we cannot rule for BLM that identification of a "drainage period" is sufficient to meet its burden of showing that Burlington should have known of drainage from the N1/2 spacing unit from data available to it at the relevant time. Even if BLM is correct that Burlington's further evaluation, spurred by the NMOCD hearing, should have led to an expectation of drainage in sec. 29, BLM requires us to rule that Burlington should have drilled a protective well in the N1/2 of the section to protect against drainage that might occur there, without any proof as to when it should have been anticipated to begin.

We find no support in regulation or precedent for such a decision. As described above, this latter proof is an element of "notice." A lessee cannot be cited for compensatory royalties for failure to drill a protective well if it is uneconomical to do so. This determination has a time element to it.

> The determination of the economic feasibility of drilling and operating a protective well is based on the anticipated recovery and costs thereof at the time that a prudent operator would have drilled the well, i.e., a reasonable time after he knew or should have known that drainage was occurring. See Atlantic Richfield Co., 105 IBLA at 225-26.

Forest Oil Corp., 141 IBLA at 303 (emphasis added). BLM suggests instead that, if it was economically feasible to drill a well at any point, Burlington had to drill to protect from drainage that might occur at an unspecified point in the future. But our precedent contradicts a ruling that a lessee may be compelled to drill a protective well, notwithstanding the time at which a well is necessary to protect from drainage, and therefore without a clear indication of the time at which well economics are relevant.

Even at the time of briefing before us, BLM does not squarely address when it believes drainage of the N1/2 unit began or when Burlington should have known it. The challenged BLM Decision states that Burlington "should have known that the subject lease was being drained in late 1985." 16/

16/ This wording leaves open whether the Deputy State Director believed drainage was occurring in late 1985, or believed Burlington should have known of such drainage in late 1985. We presume the Director meant the former; otherwise, the order to assess drainage from June 1, 1985, would improperly assess drainage occurring prior to the lessee's knowledge.

(Decision at 2.) BLM's response brief states unequivocally that "[b]y June 1, 1985, none of the offending wells had produced sufficient volumes for the drainage patterns to have crossed the lease lines into the offended spacing unit." (Response at 4.) Thus, BLM contends that no drainage was occurring on June 1, 1985, but began some time thereafter.

But neither the brief, the Decision, nor the FDO Report establishes the time period after the 1984 hearing when a string of events should have led Burlington to the realization that drainage was occurring (or would occur) from the N1/2 of sec. 29 by the end of 1985. BLM can assess compensatory royalties only a reasonable time after a lessee should have known "drainage was occurring." See Atlantic Richfield Co., 105 IBLA at 225-26; Ptasynski, 63 IBLA at 256-57 (compensatory royalties are assessed "only after the passage of a reasonable time subsequent to notification"). As noted above, we can imagine a case in which we might uphold royalties where the lessee had knowledge that drainage was imminent. But even this modification would not save BLM's case. It is not enough to state when drainage began, and that the lessee should have known it. BLM must prove how and when the lessee should have known the timing of drainage, occurring or imminent, so that the reasonable time thereafter may be determined.

BLM never makes this critical connection. Instead, its proof relates to the idea that drainage was possible from sec. 29, not when Burlington was vested with knowledge as to when it was going to happen from the N1/2. The FDO Report concludes that the pressure differential at the time of production from the Scott 100 well shows that drainage had occurred by December 1987 (FDO Report at 3), but even now does not specify when Burlington should have figured this out based on material available before that date. Rather, the position in the report is:

> Actual production was plotted from date of first reported production until January 1986. [E]ven given the uncertainty of new technology in extracting methane gas from coal seams, at the very latest, by the end of 1985 the Lessees of SF-078604 knew that adjacent wells would each produce at least 1.5-2.7 BCF. Given the fact that three of the four producing coal gas wells were in the immediate vicinity of the offended spacing unit, the lessees of SF-078604 should have drilled a protective well no later than mid 1985. A reasonable drainage period based on the information above would then be from June 1, 1985 until December 1, 1987 * * *.

(FDO Report at 4 (emphasis added).)

Thus, BLM's analysis is that "lessees of SF-078604" (which includes both the N1/2 and the S1/2 spacing units) should have known this well production data, from established wells "in the immediate vicinity of the offended spacing unit." (FDO Report at 4.) But the "immediate" vicinity of the three wells was the S1/2. This commentary is simply not enough to establish an expectation that the N1/2 of sec. 29 was being drained or when drainage would be expected to begin there.

Further, based on data from January 1986, and a conclusion that by the end of 1985, the lessees should have known what production from the offending wells should be, BLM takes the position that a "reasonable drainage period" from the lease, as opposed to the N1/2 spacing unit, should begin 6 months before, on June 1, 1985. BLM confuses the "drainage period" with the period during which compensatory royalties are due. The latter occurs within a reasonable time after which the lessee should have known drainage was occurring. BLM may not assess compensatory royalties on the basis of a "drainage period" premised on data that post-dated the period.

A conclusion as to what Burlington should have known before it drilled the Scott 100 well is complicated by the 1996 FDO Report's reliance for drainage figures on data that post-dates the drainage period in this case. BLM's Response Exhibit 2 is a chronology of developments in coal bed methane technology and extraction, including information gleaned from 1986 forward, that is critical to BLM's drainage assessment:

> Jan 1986 [Burlington] begins a 20 well Fruitland Coal development program with the drilling of Payne #6 and Payne #8 (the first coalbed methane wells in Cedar Hill not operated by Amoco).
>
> Dec 1987 First production, Scott #100 (*Protective Well for the N/2 of Section 29)*
>
> Jan 1988 Vertical expansion of the Cedar Hill Basal Fruitland Coal Pool (to include the Upper coal seams in the pool) (NMOCD Hearing).
>
> * * * * * * *
>
> May 1989 Mesa Operating and Gas Research Institute (GRI) conduct extensive testing at Hamilton #3 wellsite located in Cedar Hill Pool.
>
> * * * * * * *
>
> Dec 1989 The results of testing conducted at Hamilton #3 are published.
>
> Feb 1991 The first comprehensive study of coalbed methane in the area is published under the title "San Juan Basin Coalbed Methane Spacing Study."

(Response Exhibit 2, "Chronology of Events," at 2.)

Information developed subsequent to 1987 when the Scott 100 protective well began to produce is critical to BLM's determination that drainage occurred, and how much occurred. For example, Response Exhibit 6, on which BLM relies (FDO Report at Exhibit 16), for the conclusion that

there was a northwest/southeast drainage orientation is entitled "Cleat Orientation Rose Diagram, Mesa Operating Limited Partnership Hamilton No. 3." The Chronology above demonstrates that Mesa/GRI undertook this testing in 1989, over a year after first production from the Scott 100 protective well. We find nothing in the record to suggest Burlington should have anticipated this cleat orientation prior to 1985, prior to mid-1987 when it began to develop the Scott 100 well, or even prior to 1989.

Likewise, BLM bases its drainage volume information from a theory developed by a person named "Langmuir." (FDO Report at 3.) BLM describes the theory:

> Physical adsorption of methane molecules is the adhesion of a single layer of gas molecules to the internal micropore surfaces of the coal matrix. The ability of an individual coal seam to adsorb gas molecules is dependent on carbon content (maturity) and depth (temperature).
>
> Desorption is the process whereby adsorbed gas molecules become detached from the pore surfaces and take on kinetic properties of free gas. Desorption occurs through pressure depletion, increased temperatures, or displacement. Results of tests on coal samples are applied to a formula to achieve a "desorption Isotherm." Gas content of the coal at any given pressure can be determined using the Isotherm. ***Exhibit E*** is a portion of the "San Juan Basin Coalbed Methane Spacing Study" which addresses the principals [sic] of Langmuir's theory.

Id. We cannot know with certainty which pages constitute Exhibit E, because BLM did not mark them in our copy of the record. But several pages that contain mathematical data and formulas regarding Langmuir's theory appear in the attachments with exhibit numbers as opposed to the letters identifying FDO Report exhibits. We infer from BLM's comments that these were exhibits to the "San Juan Basin Coalbed Methane Spacing Study." But, according to BLM's Chronology, this document was the "first comprehensive study of coalbed methane in the area" and it was dated 1991 — over 3 years after the Scott 100 protective well went into production.

Likewise, the FDO Report relies on the "closest desorption data" which was derived from the Hamilton #3 well, and "desportion isotherms based on testing of coal samples taken from Hamilton #3 cores." (FDO Report at 3, citing Exhibits H and I.) The FDO Report concludes:

> ***Exhibit J*** contains the drainage calculations (based on reservoir pressure reduction) for the offended spacing unit. Gas removed from the reservoir is determined by calculating gas content at virgin formation pressure using Langmuir's equation and subtracting calculated gas content at partially depleted pressure. The resulting sum (25) is the volume of gas (scf) removed from each ton of coal.

(FDO Report at 3.) In short, BLM calculated drainage and reservoir pressure using a theory published in a document studying coalbed methane "for the first time" for the area in 1991 and data from a well tested in 1989.

This data post-dates the entire drainage period. We understand that BLM is basing its drainage calculations — not notice — on these exhibits. But this subsequently developed "desorption data," based on the Hamilton #3 test data, appears critical to "determining the volume of gas removed from each ton of coal" (FDO Report at 3), as well as the mechanism of coalbed methane movement and where it travels. Certainly, this information was fundamental to BLM's 1992 discovery that drainage may have occurred. Presumably, it also would have been relevant to any expectation by Burlington of drainage, pressure and orientation patterns that would have suggested the need for a protective well. We cannot find in this record the missing link between this information necessary to assumptions about drainage and what Burlington had available to it prior to 1987.

This problem is compounded for us by BLM's repeated equation of "notice" with Burlington's 1986 pilot program to study the best methods of coalbed methane production. See, e.g., Decision at 2. BLM asserts that Burlington would not have undertaken a $9 million pilot project to drill 20 wells without knowing information about production from related wells. (FDO Report at 5-6.) But this does not supply the missing proof — that Burlington should have understood from available data that drainage would be expected to occur in the N1/2 of sec. 29 sometime before mid-1987 when it began to develop the Scott 100 well.

Indeed, the fact of the pilot program is susceptible of the opposite interpretation. Burlington claims to have drilled four wells in 1986, 16 in 1987, and 180 wells in 1988. (SOR at Exhibit 3, Biemer Aff. at 8, paragraph 5(a).) This suggests that Burlington, like Mesa/GRI and the publisher of the February 1991 "San Juan Basin Coalbed Methane Spacing Study," was attempting to obtain important information about the resource and did so from the first 20 wells' drilling, or else it would not have drilled 180 new wells in 1988.

Nor do BLM's efforts to show from pre-1986 data that a well would have been economic in 1985 (FDO Report at 5-6), answer the question. The rule is not that a well must be drilled if it is economic to do so; the former is true if the lessee has notice that drainage is occurring. The fact that Burlington could have anticipated that a well would have been economic to drill in 1985 does not answer what Burlington should have known about drainage prior to the mid-1987 time frame in which it began to drill the protective well.

We have made every effort to sort through this puzzle, to exclude later available data, and determine what Burlington should have known or expected about drainage from the N1/2 of sec. 29 on June 1, 1985. We cannot determine on this record that it should have presumed drainage was

occurring or would occur by then or before the middle of 1987. BLM's proof is that the lessee should have known of available data about the offending wells' production in and before January 1986. It does not articulate why, based on this or other data available to it at the time, Burlington should have known drainage was occurring or even imminent in the N1/2 spacing unit of sec. 29 prior to mid-1987, a reasonable time prior to completion of the Scott 100 well. This was BLM's burden.

B. The Drainage Calculation.

Our conclusions about notice dispose of this case. Nonetheless, we also conclude that BLM's drainage calculation is insufficiently supported, or is sufficiently disputed, such that we would reverse the decision. In the instant case, Burlington has made a specific challenges to BLM's drainage calculation of 633,000 Mcf that remain uncontroverted by the record or by BLM. Were we to find resolution of those factual issues to be necessary, we would be compelled to reverse BLM's decision for failure to sustain its drainage calculations.

For example, Burlington proffers that it was arbitrary for BLM to assess more drainage from the N1/2 of sec. 29 than from the S1/2 for a longer period. BLM's defense is that the discrepancy is a result of the facts that Federal ownership of the S1/2 spacing unit is approximately 50 percent and that much drainage occurred from the S1/2 prior to the 1985 date Burlington could have been expected to drill a protective well. (Response at 8.)

This argument contradicts the undated drainage map (BLM Exhibit 7), on which BLM relies to prove this point, as well as BLM's actual August 23, 1995, drainage assessment for the S1/2. That latter document states unequivocally that, with respect to the southern spacing unit, "[d]rainage commenced on or about June 1, 1985 and ended January 2, 1992 when the protective well began to produce." (SOR Exhibit 6 (emphasis added).) BLM's drainage map at Exhibit 7 shows communication between the State well and the S1/2 of sec. 29 beginning as of that date.

Thus, the documentation before us suggests that starting June 1, 1985, when drainage "commenced" in the S1/2 of sec. 29, and for the ensuing 6.5 years, BLM assessed drainage on a presumption that the entire S1/2 spacing unit was drained of approximately 1,200,000 Mcf of gas. 17/ At the same time, BLM asserts drainage of 633,600 Mcf of gas from the N1/2 spacing unit prior to December 1987, but some reasonable time later than the June 1985 date when the three offending wells "commenced" draining the S1/2 of

_____

17/ This rough number is based on doubling the drainage assessment for the 6.5-year period (599,742 Mcf) to account for the fact that the Federal lease comprised approximately 50 percent of the S1/2 spacing unit. This is the percentage ownership which BLM claims reduced the S1/2 drainage figure.

the section. Put together, BLM's assessments presume that (a) drainage must have commenced in the N1/2 spacing unit almost simultaneously with and at an equal or greater rate than drainage in the southern half, which was much closer to the three offending wells; (b) the majority of the drainage (633,000 Mcf or more) for both spacing units occurred within the first 2 years (1985-87), and (c) drainage must have dropped off to almost half its previous rate to account for the remaining 567,000 Mcf drained from the S1/2 in the ensuing 4 years (January 1988 through December 1991).

We agree with Burlington that this theory of drainage is refuted by this record. In fact, as noted above, BLM's Exhibit 7 is a drainage pattern map projecting the drainage situation as of June 1, 1985; this map shows no effect from the Schneider or Cahn well on the S1/2 spacing unit on that date, and no remote drainage connection between any of the three wells and the N1/2 spacing unit. Burlington substantiates its claim that BLM's drainage assessment figure for the northern spacing unit in sec. 29 is arbitrary.

Likewise, contrary to BLM's suggestion, we cannot reject as irrelevant Burlington's argument that BLM is assessing Burlington for all drainage since 1978. BLM argues that drainage did not begin from the N1/2 spacing unit until 1985, and, therefore, an assessment for all drainage "since 1978" is equivalent to that "since 1985." But Burlington relies on certain BLM geological assumptions to assert there may have been a pressure reduction in the N1/2 spacing unit prior to 1985. As we understand it, Burlington does not agree with BLM's geological data, but contends that if they are correct, then, based on the pressure decline in the Schneider well from 1985 to 1987 (195 psi), the only amount of pressure decline that can be imputed to the N1/2 spacing unit during the same period is the same decline of 195 psi. (Burlington SOR Exhibit 3, Biemer Aff. at paragraph 2, pps. 5-6.) According to Burlington, BLM's various data points would compel a conclusion that pressure in the N1/2 unit would have been approximately 1,400 psi in 1985, yet BLM is assessing for drainage from an initial pressure assumption of 1,562 psi. BLM's dogged assertions that the pressure in 1985 was 1,562 psi do not respond to this point. Indeed, testimony submitted by BLM into the record at FDO Report, Exhibit U, is consistent with the notion that the pressure at the Schneider well had dropped "substantially" by the time the State well went onto production in 1981. (Transcript at 34.) Thus, BLM has not sufficiently refuted the notion that it is assessing for drainage that occurred prior to 1985.

Likewise, Biemer makes a number of allegations that BLM used improper pressure differentials in its calculations. According to Biemer, BLM overstated the pressure differential by focusing only on the reservoir pressure of 1,562 psi in 1978 when the Cahn well went on production. As described above, Biemer claims that a construction of BLM data shows that pressure in the Scott 100 well location could have been at most 1,400 psi in 1985 (the 1,200 psi found in the Scott 100 well at its first production in 1987 +

195). (Biemer Aff. at 5-6.) BLM restates only that the "fact remains that the original reservoir pressure of 1562 PSI in the Cedar Hill Fruitland Coal seams was reduced to 1205 PSI in all of the coal seams underlying Federal acreage located in the N/2 of Section 29 by the time a protective well was completed." (Response at 6.) 18/ This assertion simply does not justify BLM's use of 1,562 psi in the face of contradictory information in the record.

The same is true with regard to other aspects of BLM's drainage calculations. Burlington's expert petroleum engineer, Leonard Biemer, Jr., disagrees with the FDO Report's use of coal thickness of 44 feet within its calculations. He states that by employing this thickness figure, BLM presumes communication between all reservoirs of the offending wells and the Scott 100 well. Biemer claims that, by contrast, only 22 feet of the basal coal reservoir in the offending wells are in pressure communication with the Scott 100 well because the upper coal intervals of the offending wells are cemented behind pipe. (Biemer Aff. at 4.) BLM contests Biemer's points by arguing that "pressure/gas content equalization between the Upper and Basal coal seams" is shown by its records for the State well (Response at 5, citing Exhibit 4), but does not make the same showing for the other two offending wells. Moreover, in testimony submitted by BLM into the record at FDO Report, Exhibit U, the witness testified to a "20-foot coal seam." (Transcript at 37.)

Contrary to BLM's dismissal of Burlington's offer of proof as "superficial," "illogical," and "needless" (Response at 9), Burlington has raised challenges to BLM's drainage assessment which BLM fails to refute. Neither BLM nor its data supports the drainage calculation found in BLM's decision.

Conclusion

Thus, we conclude that the information submitted by BLM is insufficient to establish its case. BLM fails to meet its burden of showing that Burlington had knowledge, or should have known, that drainage was occurring from the N1/2 of sec. 29 prior to the time Burlington began to drill the Scott 100 offset well. And it fails to present sufficient evidence upon which we could affirm BLM's drainage assessment. Accordingly, we must reverse BLM's Decision assessing compensatory royalties.

18/ BLM cites its Exhibits 6 and 7 in response to Biemer's point (Response at 6), though we do not understand these diagrams to respond to Biemer's pressure differential assertions. We also question the consistency between these exhibits. Exhibit 6 shows a NW/SE axis butt cleat along which drainage could occur. But Exhibit 7 purports to represent drainage as it was occurring on June 1, 1985, and shows an elliptical pattern following a strong NE/SW trending axis. This latter exhibit suggests that the drainage from the three wells was expanding toward secs. 28 and 32 at a far greater rate than toward the N1/2 of sec. 29.

Accordingly, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 C.F.R. § 4.1, the decision appealed from is reversed.

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Lisa Hemmer
Administrative Judge

I concur:

_____
C. Randall Grant, Jr.
Administrative Judge